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Hardy, James; Thomas, Aled V.; Blanchfield, Anthony W.

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Author names and affiliations:

James Hardy, Aled V. Thomas, & Anthony W. Blanchfield
Institute for the Psychology of Elite Performance, School of Sport, Health and Exercise Sciences, Bangor University, Normal Site, Bangor, Gwynedd, Wales LL57 2PZ

Corresponding Author:

James Hardy,
School of Sport, Health and Exercise Sciences,
Bangor University,
George Building,
Normal Site,
Bangor,
LL572PZ
E-mail: j.t.hardy@bangor.ac.uk
Work Telephone: (01248) 38 3493

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Abstract

Self-talk enhances physical performance. Nothing is known however about the way that a subtle grammatical difference in self-talk, using first or second person pronouns, may effect performance. As second person self-talk supports self-regulation in non-exercise populations, we hypothesized that 10 km cycling time-trial performance would be superior following second versus first person self-talk. Using a randomized, counterbalanced, crossover design, sixteen physically active males (M_{age} = 21.99, SD = 3.04 years) completed a familiarization visit followed by a 10 km time-trial during two separate experimental visits using first and second person self-talk. A paired t-test revealed that second person self-talk generated significantly faster time-trial performance than first person self-talk (p = .014). This was reflected in a significantly greater power output throughout the time-trial when using second person self-talk (p = .03), despite RPE remaining similar between conditions (p = .75). This is the first evidence that strategically using grammatical pronouns when implementing self-talk can influence physical performance providing practitioners with a new aspect to consider when developing interventions. We discussed findings in the context of a self-distancing phenomenon induced by the use second person pronouns.

Relatively recent systematic reviews of this research literature attest to the positive effects of self-talk on performance, reporting consistent performance benefits of moderate effect size (Hatzigeorgiadis, Zourbanos, Galanis, & Theodorakis, 2011; Tod, Hardy, & Oliver, 2011). Furthermore, there is empirical support that such positive effects hold across different types of tasks; fine motor skills such as golf putting (d = .67), and gross motor skills such as maximal leg extension tasks (d = .26; Hatzigeorgiadis et al.). Within the existent research literature it is also apparent that different types of phrases said to oneself moderate any such performance benefits from self-talk (e.g., Theodorakis, Weinberg, Natsis, Duma, & Kazakas, 2000). Hardy, Tod, and Oliver (2009) coined this differential expectation the *task demand matching hypothesis* where instructional self-talk is theorized to be more beneficial than motivational self-talk for skills involving accuracy, form, and precision; although motivational self-talk is predicted to be superior to instructional self-talk for gross motor tasks involving strength and endurance (Theodorakis et al., 2000). Furthermore, available meta-analytic data offers some empirical support for this hypothesis (e.g., instructional self-talk – fine task, d = .83 and instructional self-talk – gross task, d = .22; Hatzigeorgiadis et al.). However, within the self-talk literature, there remains a propensity for researchers to utilize discrete motor skills in their study designs. Consequently, the inclusion of endurance based experimental tasks that possess reasonable ecological validity (e.g., a time trial cycle as opposed to a seated leg extension task) would help to provide practitioners with firmer evidence based direction.

Despite recently introduced perspectives on self-talk (e.g., Van Raalte, Vincent, & Brewer, 2016) little specific guidance is given with regard to how self-talk ought to influence *endurance* performance. Of note, a number of relatively recent investigations of self-talk and endurance have drawn from the psychobiological model of endurance performance (Marcora, 2008) to explain the reported positive effects. This perspective presents reasoning for the role of motivational self-talk in human endurance, placing an emphasis on individuals' perceived effort (RPE). Based on motivational intensity theory (Brehm & Self, 1989), the psychobiological model posits that endurance exercise performance is driven by effort based conscious decision making. Hence, during a constant intensity physical task, an individual chooses to stop exercise when they perceive a very high level of effort (Marcora, 2008), whereas during self-paced time-trial (TT) exercise an individual consciously regulates their pacing to compensate for the positive/negative effect of an intervention on perception of effort (De Morree & Marcora, 2013; Pageaux, 2016). The relevance of Marcora's theorizing is that any psychological (or physiological) factor affecting an individual's perception of effort will in turn, influence endurance performance. In the case of self-paced TT exercise, for interventions that have a positive effect on performance, this frequently translates as an increase in power output without a change in RPE (Barwood, Corbett, Wagstaff, McVeigh & Thelwell, 2015; Chambers, Bridge & Jones, 2009). This is because an increase in power output without an accompanying increase in perceived effort indirectly suggests that effort perception has been positively modified in some way.

With regard to the use of motivational self-talk said during the execution of aerobic tasks, it is likely to enable the performer to achieve a more positive (i.e., confident and motivated) activation state (e.g., Hatzigeorgiadis, Zourbanos, Goltsios, & Theodorakis, 2008) that in turn, influences his/her perceptions of effort (Gendolla, 2012). Blanchfield, Hardy, de Morree, Staiano and Marcora (2014) were the first to utilize the psychobiological model of endurance performance to understand the effects of motivational self-talk. Using a time-to-exhaustion paradigm, these researchers showed that motivational self-talk yielded reduced effort perception and enhanced aerobic performance (i.e., 18% improvement) compared to a control group. When a TT paradigm has been employed by researchers similarly supportive but not identical findings have been reported. For example, Barwood et al. (2015) subsequently suggested a perceptual benefit of motivational self-talk during self-paced TT exercise have indeed found that motivational self-talk resulted in superior 10 km TT cycling performance and elevated power output, despite similar RPE compared to neutral self-talk. The above findings demonstrate that the content of athletes' self-talk is an important aspect for practitioners designing self-talk interventions to consider. Nevertheless, other aspects of self-talk have received far less investigation from sports researchers, yet mainstream psychology research (e.g., Kross et al., 2014) provides merit for their examination; one of these is *how* self-talk is said.

Grammatical aspects of speech have only recently been examined in the context of self-talk and the motor domain. For instance, Van Raalte et al. (2017) investigated the impact of interrogative and declarative self-talk; that is, self-talk phrased as questions or statements, respectively. Contrary to findings reported in the mainstream literature (e.g., Senay, Albarraci, & Noquchi, 2010) and across six experiments, no differences between interrogative and declarative self-talk emerged for motivation, RPE, and performance. One explanation for these null findings is how the self-talk intervention was conducted. In order to replicate previous research, Van Raalte et al. employed a pre-task intervention. However, this is largely at odds with traditional sports-oriented motivational self-talk interventions that place an emphasis on the use of self-talk *during* task execution.

Whether self-talk is said using the first-person ("I can do this") or the second-person ("You can do this") pronoun perspective is another aspect of grammar that has yet to be investigated within the sports domain. However, existing research supports the case that using the second-person perspective is beneficial when the task at hand requires self-regulation (e.g., Dolcos & Albarracin, 2014; Kross et al., 2014). One reason for this is related to Dolcos and Albarracin's supposition that humans become accustomed to directions and guidance given using non-first person pronouns from significant others (e.g., parents, coaches); a process that enables us to integrate societal values and ideals into our self-system. In-direct support for this habituation explanation comes from the finding that individuals use more second-person pronouns when making autonomous decisions involving self-regulation, such as when exercising (e.g., Gammage, Hardy, & Hall, 2001; Zell, Warriner & Albarracin, 2012). Kross and colleagues forward another explanation that overlaps with the St. Clair Gibson and Foster (2007) "time wedge" concept regarding the role of self-talk during exercise. That is, self-talk is said to act to separate the self from what he/she is experiencing. Kross et al. argue that the use of second-person pronouns reflects the adoption of a broader self-distanced perspective similar to a "fly-on-the-wall" perspective. Aligned with this theorizing, a number of studies have operationalized the degree of first-person pronouns present within writings of emotional experiences as a marker of self-distancing (e.g., Cohn, Mehl, & Pennebaker, 2004). Attesting to the potential efficacy of second person pronouns, the concept of self-distancing is also a prominent feature of several psychotherapies and has been referred to as encouraging the “self as context”. Furthermore, Beck (1970) referred to distancing as a process enabling clients to think more objectively about their irrational thoughts. Kross et al. (p. 305) surmised that “the language people use to refer to the self … may influence self-distancing, and thus have consequential implications for their ability to regulate their thoughts, feelings, and behavior under stress”. Indeed, Kross et al. provide some support for their theorizing that second-person pronouns can encourage individuals to adopt a more distanced perspective regarding what is going on around them and as a result cope better than when using the first-person pronouns.

To date, whilst athletes report using both first and second-person pronouns as part of their self-talk (Hardy, Gammage, & Hall, 2001) and mainstream psychology evidences the benefit of the second-person perspective for tasks such as anagrams (Dolcos & Albarracin, 2014) and social speeches (Kross et al., 2014), experimental comparison of these grammatical features within the motor domain has not occurred. Consequently, practitioners devising self-talk interventions would likely benefit from the efforts of applied researchers attempting to provide guidance on this issue. Drawing on the psychobiological model of endurance performance and self-talk research using a TT paradigm (e.g., Barwood et al., 2015), in the present study we examined whether how one uses self-talk influences performance, work rate, and RPE on a 10 km cycle TT endurance task. Given that existing literature already offers support that performers can enhance their endurance via the use of self-talk compared to control conditions (e.g., Blanchfield et al., 2014), the current investigation focused on the relative effectiveness of first and second person pronouns. More specifically, we hypothesized that superior TT performance would result from use of second person pronoun self-talk as opposed to first person self-talk. The rationale for this prediction stemmed from the self-distancing potential of second-person pronouns, and that participants would be more receptive to their self-provided (second-person) advice and encouragement and so work at a higher intensity, yet would not report differences for RPE (cf. Barwood et al., 2015).

Method

Participants

Sixteen recreationally active and healthy males volunteered to take part in the study (M_{age} = 21.99, *SD* = 3.04 years old; M_{height} = 181.87cm, *SD* = 6.99; M_{weight} = 83.34kg, *SD* = 18.68). Participants self-reported engaging in physical activity on a regular basis ($M_{\textit{weekly exercise frequency}}$ = 3.63, *SD* = 1.54; $M_{\text{weekly exercise duration}}$ = 297.50mins, *SD* = 262.87), competing at university and club levels in various sports such as rugby, boxing, soccer, Gaelic football, and rock climbing. All were familiar with high intensity noncycling exercise. Sensitivity calculations indicated that our sample size was adequate to detect effects comparable with those reported in the self-talk literature utilising similar tasks (e.g., Blanchfield et al., 2014); powered at .80 and using a 5% level of significance, we could detect medium to large sized effects, η^2 = .37). Ethical approval was granted in accordance with the formal ethical procedures of the School of Sport, Health and Exercise Sciences, Bangor University and conformed to the declaration of Helsinki. All participants were fully informed of the procedures and risks associated with the research prior to providing written consent to participate in the investigation.

Design

We employed a repeated measures design whereby participants were randomly counterbalanced after a familiarization visit into either a first-person or second-person self-talk condition performed in their second visit, with the opposite form of self-talk employed in their final visit. Dependent variables were cycling TT performance, average power output, and RPE. Participants completed a 10 km cycle TT (Wattbike Pro) on each visit.

Measures

RPE: To measure RPE we used the 11-point CR10 scale developed by Borg (1998). Low (0.5 = very, very light) and high (10 = maximal) anchors were established using standard procedures (Borg, 1998). It was also emphasized that each rating should be based on the effort required to perform the TT as opposed to any leg muscle pain occurring during the cycling exercise (Blanchfield et al., 2014).

Average power output: Average power output (watts) per km was captured by the Wattbike Expert Software linking information concerning work performed during the TT on the Wattbike Pro to a laptop.

Performance: We operationalized performance as the completion time (seconds) for the 10 km cycle TT.

Mood: We measured participants' mood via by the UWIST mood adjective checklist (UMACL; Matthews, Jones, & Chamberlain, 1990). The UMACL contains eight items describing current feelings and subdivides into a positive and negative mood subscale. Responses are provided on a 7-point Likert type scale (1 = *not at all*, 4 = *moderately*, and 7 = *very much*).

Motivation: We also assessed motivation through the 14 item success and intrinsic motivation scale (Matthews, Campbell, & Falconer, 2001) comprising two subscales. The success and intrinsic motivation subscales are scored on a 5-point Likert type scale (0 = *not at all* to 4 = *extremely*).

Procedures

For each visit, participants wore light and comfortable clothing and refrained from eating within an hour of the TT, consuming alcohol within twenty-four hours of the TT, performing exhaustive exercise within 48 hours of the TT, and consuming caffeine or nicotine within three hours of the TT. These baseline conditions were confirmed by the researcher at the beginning of each visit to the laboratory. Participants first attended a familiarization visit consisting of three phases; warm up, TT, and development of self-talk cues. Upon completion of the relevant forms, height, weight, and bike set-up measurements were noted, and all participants carried out a standardized warm up, consisting of a five-minute cycle maintaining approximately 90 watts and 70 revolutions per minute (resistance on the Wattbike was set at “2” and the magnetic resistance at “1” for all participants and visits). After completing the warm up, and prior to the TT, all participants were taught how to use the Borg CR10 scale. To achieve this, memory anchoring procedures were used whereby participants were instructed that a rating of 0.5 on the Borg CR10 scale would equate to instances where very minimal effort was perceived during a physical task, whereas a rating of 10 would correspond to the highest effort ever encountered during a physical task (Noble & Robertson, 1996; Pageaux, 2016). Participants where then instructed that after every km, they would be asked ”How hard, heavy and strenuous does the exercise feel?” (Blanchfield et al., 2014), and asked to respond by rating their effort perception on the Borg CR10 scale. Importantly, following an explanation of self-talk given prior to the TT, participants were prompted at each km to say aloud statements they had said to themselves during that km of their familiarization TT, this was recorded verbatim by the experimenter and gave participants an opportunity to actively contribute to their own interventions. After completing the TT, participants carried out a 3 minute cool-down. Participants’ naturally occurring self-talk was generally devoid of instructions, tended to be more motivational in nature but was not overtly negative in content.

Similar to previously published self-talk interventions (e.g., Barwood, Thelwell, & Tipton, 2008), our participants completed a structured workbook in preparation for the following two experimental TTs involving first and second person self-talk. Via the workbook we attempted to raise participants’ awareness of their use of self-talk (cf. Hardy, Roberts, & Hardy, 2009) and provided a mechanism to change any negative self-talk captured during the familiarization TT into motivational and positive first person and second person self-talk statements. Consequently, our participants could deploy more functional statements during their TTs as well as counter any negative self-talk said during these trials. We also ensured that the new statements were brief and phonetically simple (Landin, 1994), and viewed by our participants as motivational (Hardy, Hall, & Alexander, 2001b). For example, if a participant said ”This is hurting” during the familiarization TT, the statement might be transformed into ”*I* can tolerate this” and ”*You* can tolerate this”. Identical to Barwood et al.’s (2015) effective self-talk intervention for the same TT task, statements were created for use at the following distances; 0-2 km, 2-4 km, 4-6 km, 6-8 km, and 8-10 km. See the Appendix for an illustrative example of this process. Overall, participants provided themselves with encouragement across the five stages of the TT. However, there was a tendency for participants’ self-statements to change from countering their legs hurting (e.g., 4-6km: “I/You can deal with the pain”; “I/You can keep going”) in the mid-stages, to highlighting the need to work harder (e.g., 8-10km: “I am/You are going to finish strong”; “I/You can go flat out now”) at the latter-stages. Approximately 24 hours before each experimental trial, we emailed participants to confirm their arrival and reminded them about the self-talk cues they were to use during the upcoming visit. Additionally, as part of welcoming participants to the laboratory, the experimenter verbally reminded participants about the self-statements the participants had created and were to use during the trial. Because of the above features, we guided our participants to design highly personalized cues, tailored to the task at hand, which according to Theodorakis et al. (2000) should help to optimize our manipulation. The workbook and subsequently developed self-talk from the familiarization visit were retained by the experimenter for later use.

Prior to each TT, including the familiarization TT, participants completed the relevant consent forms, the UMACL, and the success and intrinsic motivation scale. When the participants returned for their next two experimental TTs involving ”I” or ”You” forms of self-talk, they performed the same standardized warm-up as carried out in the familiarization visit. The appropriate list of developed statements were discussed before and made visible during the TTs on a computer screen placed (approx. 1m) in front of the participants; participants were reminded to utilize their personalized statements at the appropriate distances (Barwood et al., 2015), along with need to rate their perceived effort every km. During the TT’s all participants silently recited the statements to themselves, as it is possible that self-talk said out-loud can be awkward and distracting (Masciana, Van Raalte, Brewer, Branton, & Coughlin, 2001). Gaining active input from our participants in the development of their intervention was deliberate as this ought to create self-talk statements with personal meaning (Hardy, 2006), and foster enhanced perceptions of control over the performance environment (cf. Deci & Ryan, 1985), increasing the effectiveness of the intervention (Hatzigeorgiadis et al., 2011).

Participants were administered a manipulation check after their cool-down. Example manipulation check items were; “To what extent did you adhere to the instructions that were given to you before and during the cycling task?”, “To what extent did your self-talk reflect a first person (i.e., ‘I’ types of statements) / second-person (i.e., ‘You’ types of statement or included your own name) perspective?” and “How motivating did you find the self-talk you used during the time trial?” (cf. Hardy et al., 2001b). There was a period of three to seven days between each visit to allow sufficient recovery. Participants performed the experimental TTs at the same time of day as the familiarization TT.

Data Analysis

Data analysis for performance and the manipulation check data were conducted via paired *t*-tests with the exception of our analysis of possible ordering effects. As far as RPE and average power output per km were concerned, 2 (condition) x 10 (distance) fully repeated measures ANOVAs were calculated. Effect sizes *F*-ratio scores are reported via η_p^2 with values of .10, .25, and .40 reflective of small, medium, and large effects sizes (Cohen, 1988). For *t*-tests standardized Cohen’s *d* values were calculated using Equation 11.9 from Cumming (2012) with thresholds for small, moderate or large effects set at 0.2, 0.5, and 0.8 respectively (Cohen, 1988). Where relevant, 95% confidence intervals are reported throughout to show the plausible upper and lower bound differences between conditions. In the vast majority of cases, data met the assumptions underpinning the respective statistical analyses. When this was not the case, a Greenhouse-Geisser correction was applied to reduce the chances of committing Type I errors. However, it is worth being mindful that both types of analyses are robust to moderate violations of their assumptions (e.g., Tabachnick & Fidel, 2014).

Results

Manipulation checks

Descriptive statistics for all study variables are reported in Table 1. Paired *t*-tests regarding pre-task mood and motivation states confirmed no differences across conditions: positive mood, $t(15) = -.35$, $p = .73$, $d = .09$; negative mood, $t(15) = .13$, $p = .90$, $d = .04$; success motivation, $t(15) = -.41$, $p = .69$, $d = .07$; intrinsic motivation, $t(15) = -.67$, $p = .51$, $d = .22$. In addition, participants' use of self-talk was as expected, offering support for the integrity of the study's internal validity. That is, participants reported adhering to their respective instructions before and during the TT in both conditions, $t(15) = -.95$, $p = .36$, $d = .03$, and found their first and second-person self-talk cues equally motivating, $t(15) = .45$, $p = .66$, $d = .14$, and useful, $t(15) = .73$, $p = .48$, $d = .21$. Moreover, when in the first person condition participants used significantly more first person self-talk than second-person self-talk, $t(15) = 14.50$, $p < .001$, $d = 4.78$, and vice versa for the second-person condition, $t(15) = -13.08$, $p < .001$, $d = 4.71$. Furthermore, results from a 2 x 2 (self-talk condition x ordering of conditions) mixed model ANOVA revealed null effects and evidence for the lack of an ordering effect on TT performance, $F(1, 14) = 1.88$, $p = .19$, $\eta_p^2 = .12$.

****Table 1 near here****

Performance

Results from the paired *t*-test presented support for our main hypothesis. That is, when participants completed the TT in the second-person self-talk condition they performed significantly faster (*M* = 1045; *SD* = 95 seconds) than when in the first-person self-talk condition (*M* = 1068; *SD* = 104 seconds), with a difference between conditions of 2.2%; $t(15) = 2.77$, $p = .014$, $d = .24$, 95% CI [5.37s, 41.38s]. Importantly, on an individual level, 13 of the 16 participants performed the TT faster in the second person self-talk condition (see Figure 1).

****Figure 1 near here****

Average power output

As average power output was captured for each kilometer of the 10km TT, a 2 (self-talk condition) x 10 (distance) fully repeated ANOVA was conducted and revealed a main effect for both self-talk condition, $F(1, 15) = 6.08$, $p = .03$, $\eta_p^2 = .29$, and distance, $F(1.88, 28.20) = 12.66$, $p < .001$, $\eta_p^2 = .46$, but a nonsignificant interaction, $F(2.73, 40.89) = 1.16$, $p = .34$, $\eta_p^2 = .07$. Participants produced an elevated work rate in the second-person as compared to the first-person condition (see upper Figure 2).

RPE

The 2 (self-talk condition) x 10 (distance) repeated measures ANOVA for RPE indicated a main effect for distance, $F(1.62, 24.31) = 84.65$, $p < .001$, $\eta_p^2 = .85$, but neither the effect of self-talk, $F(1, 15) = .11$, $p = .75$, $\eta_p^2 = .01$, nor the interaction, $F(2.37, 35.60) = .96$, $p = .40$, $\eta_p^2 = .06$, were significant (see lower Figure 2).

****Figure 2 near here****

Discussion

The present study is the first to examine the potential benefit of how a relatively subtle change in *how* athletes speak to themselves using a first-person or second-person perspective impacts on endurance performance. When using second-person self-talk, participants completed the 10km cycling TT significantly quicker, worked harder, yet did not perceive there to be a difference in effort compared to when completing the task in the first-person self-talk condition. Collectively, the findings support our a priori hypotheses and for the first time, illustrate the benefit of considering grammatical features when constructing self-talk interventions aimed at targeting motor performance.

Our significant effect for TT performance offers encouragement for the potency of this subtle change in the self-talk used by our participants and our theorizing concerning second person pronouns. When using this more familiar perspective during an event requiring self-regulation (i.e., second-person pronouns; Dolcos & Albarracin, 2014), our participants' motivational self-talk seemed to enable them to work at a higher exercise intensity and affording them the opportunity to complete the 10km TT faster. Importantly, participants did not perceive that they had to work harder to achieve these performance related benefits. This implies that second person self-talk is a more efficient perceptual strategy (i.e., greater absolute workload for no "cost" in RPE) for endurance athletes during exercise. This conforms to the tenets of the psychobiological model of endurance performance (Marcora, 2008) emphasizing the role of perceptions of effort for endurance.

Kross and colleagues (2014) highlight self-distancing as a path through which second-person pronouns influence our ability to regulate feelings, thoughts, and behavior under stress. Furthermore being able to distance oneself from a more self-immersed perspective can impact on how individuals process events and experiences once they have occurred (Kross et al.). For instance, within the domain of sport this might mean interpreting an error or poor competition performance more positively. However, to date, the concept of self-distancing has not been systematically investigated within physical activity research.

Sharing some similarity with Kross et al.'s (2014) self-distancing mechanism is St. Clair Gibson and Foster's (2007) "time wedge" concept proposed to underpin the role of self-talk during exercise. This "time wedge" enables the exerciser to insert time distance between the self and ongoing mental and physical activities being experienced, facilitating self-observation and awareness. A second concept related to self-distancing that may occur due to the use of second-person pronouns is linked to Brick, MacIntyre, and Campbell's (2014) supposition that self-talk utilized during endurance tasks can be viewed as a form of attentional focus termed *active self-regulation*. Active self-regulation is supposed to reflect focus on technique, cadence, pacing, and/or relaxation. According to Brick et al. a key assertion of active self-regulation is increased pace without necessarily increased perceptions of effort. Furthermore, an active self-regulation focus has been theorized to link metacognitive feelings to metacognitive judgements and estimates (e.g., judgements regarding own capabilities, estimates of effort) aiding elite runners' cognitive control during exercise (Brick, MacIntyre, & Campbell, 2015). An alternative explanation for the current findings involves the influence of pronouns to shape challenge/threat appraisals (Kross et al., 2014). More specifically, Kross et al. report on the use of pre-task second-person introspection leading to more challenge and less threat appraisals for an upcoming stressful (public speaking) event. It is possible that the use of second-person self-talk might promote more facilitative concurrent appraisals of our demanding TT task; in turn, shaping perceptions of effort (cf. Gendolla, 2012). Of course, it is only with empirical evidence that fuller understanding is this mechanistic theorizing will emerge.

We hope that the present study represents the first of many self-talk investigations examining grammatical features of self-talk to reveal instructive guidance for practitioners. Nevertheless, replication of the current findings is desirable as is extension to different types of participants. Given that trained cyclists have more consistent pacing as they are capable of reproducing performances (De Koning, Bobbert, & Foster, 1999; Barwood et al., 2015) and have probably developed their own self-talk strategies (Hardy, 2006; Barwood et al., 2015), it is not a forgone conclusion that the current findings necessarily apply to this more specialized sample (cf. Hatzigeorgiadis et al., 2011; Tod et al., 2011). Furthermore, despite our medium to large effect, our difference is less than the meaningful change of 3.6% that has been reported recently for a 10 km TT in a sample population similar to ours, albeit using a different cycle ergometer (Borg et al., 2018). Continued investigation will provide clarity on the matter. However, self-talk researchers should also explore other aspects of grammar. Establishing any (performance) differences between perfect and imperfect verb usage (e.g., Hart & Albarracin, 2009), and between interrogative and declarative self-talk *when answers are provided to questions* (e.g., Puchalska-Wasyl, 2014) are alternative candidate aspects of grammar. Also, differences reported by Son, Jackson, Grove, and Feltz (2011) regarding the use of collectivistic (“we”) and individualistic (“I”) self-talk could form a nuanced primer for teambuilding interventions.

Of greater relevance to the larger topic of self-talk, and central to the idea of the self, are individual differences. In fact, the current data revealed some response differences across our participants; while 13 of the 16 participants displayed superior performance under the second person pronoun condition, three did not. (Although we reported the individual responses to our intervention, a novel approach in the self-talk research literature, such personalized detail is consistent with the practice of sports psychology.) Yet to date investigation of the interaction of self-talk interventions with aspects of personality is largely absent (see Thomas & Fogarty, 1997 for an exception). Of particular pertinence to pronouns is the disposition of narcissism as some data suggest individuals with narcissistic tendencies use more first-person pronouns than those with less narcissistic tendencies (Raskin & Shaw, 1988). This propensity to use the first-person pronouns might make narcissists less likely to exhibit performance differences across perspectives or as the first person perspective is more central to them, will make first person pronoun self-talk more effective. However, the lack of a control condition in the present study and the challenges of incorporating them in future experiments involving pronouns, might hamper our ability to fully understanding the exact nature of the interaction between self-talk and personality.

As a result of our novel findings we are cautiously optimistic that they represent an untapped branch of self-talk worthy of further consideration by researchers and practitioners alike. Indeed a latent aim of the investigation was to raise practitioners’ awareness of the potential role of grammar for their practice, highlighting a pocket of research unlikely to have been previously reflected upon. Inevitably, answers to the above forward-looking research questions would solidify the reader’s confidence in the applicability of grammar to self-talk.

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Conflict of interest

The authors declare they have no conflict of interest.

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Table 1. *Manipulation check items and descriptive statistics*

	First person self-talk		**Second person self-talk**		**95% CI difference**
	M	*SD*	*M*	*SD*	
Post-task					
Extent adhered to instructions before and during task [a]	8.44	1.09	8.81	1.38	[-1.22, .47]
Extent that self-talk reflected first person perspective [a]	8.31	1.95	1.38	0.62	[5.91, 7.96]
Extent that self-talk reflected second person perspective [a]	2.06	1.88	9.25	1.06	[-8.36,-6.02]
How motivating was the self-talk that you used during the task? [b]	7.13	1.31	6.94	1.39	[-.71, 1.08]
How useful were the self-talk statements [a]	7.69	1.58	7.31	1.96	[-.72, 1.47]
Pre-task					
Intrinsic motivation [c]	2.94	0.56	3.03	0.47	[-.07, .32]
Success Motivation [c]	2.41	0.64	2.46	0.80	[-.30, .20]
UWIST Positive Mood [d] Subscale	4.64	0.74	4.72	1.00	[-.55, .40]
UWIST Negative Mood [d] Subscale	1.64	0.77	1.61	0.78	[-.49, .55]

Note: Values are the mean of reported scores on response scales of: [a](1-10); [b](1-9); [c](1-5); [d](1-7).

Figure Captions

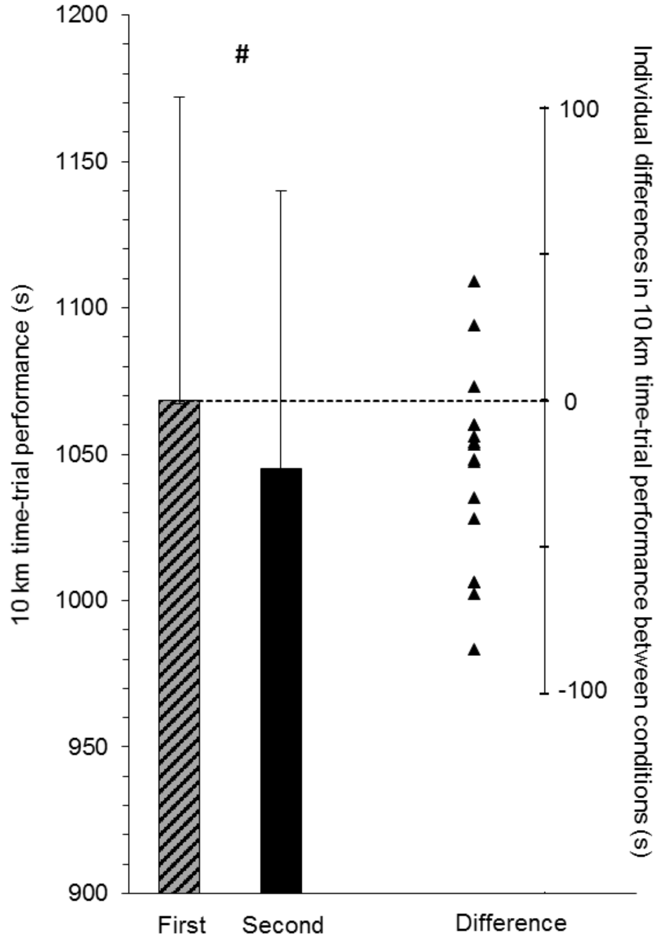

Figure 1. Mean and standard deviation 10 km cycling time-trial performance following use of first and second person self-talk during exercise. Triangles on floating secondary y-axis denote individual differences between conditions. [#]Denotes significantly different 10km time-trial performance.

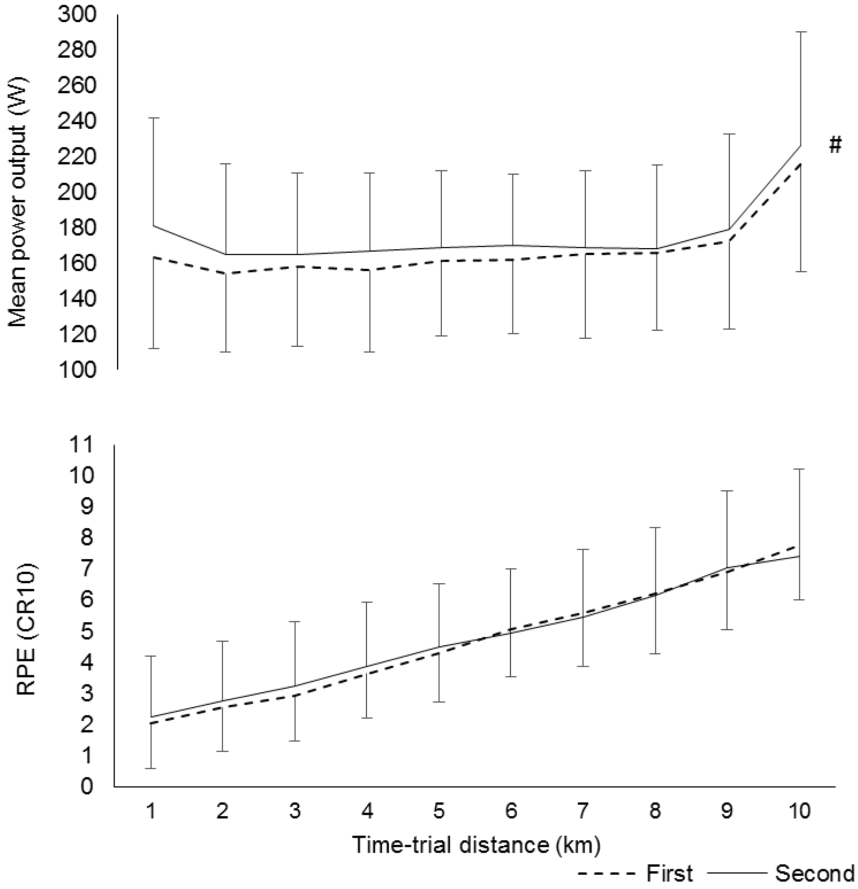

Figure 2. Mean and standard deviation power output for first and second person self-talk at 1 km intervals throughout 10 km time-trial (upper figure) and RPE for first and second person self-talk at 1 km intervals throughout 10 km time-trial (lower figure). # Denotes significant difference between conditions.

Appendix

Illustrative examples of two participants' self-talk captured and then altered for each stage of the 10km TT.

Km	*Self-talk said in familiarisation TT*	*Changed to "I" pronouns*	*Changed to "You" pronouns*
Participant A			
0-2km	C'mon Keep pushing	I can do this	You can do this
2-4km	C'mon Keep pushing Keep it smooth	I can do this	You can do this
4-6km	Keep grinding Keep pushing Almost there	I'm halfway through, almost there	You're halfway through, almost there
6-8km	Keep grinding Keep pushing Almost there Hang in there Keep your leg speed	I'm hanging in well	You're hanging in well
8-10km	Keep digging in Forget about the pain Almost there Keep picking up the leg speed	I can keep going	You can keep going

Participant B			
0-2km	I can do it It’s going well	I can do it	You can do it
2-4km	I am determined Feeling motivated	I’m determined	You’re determined
4-6km	I’m halfway there I need to keep going	I can keep going	You can keep going
6-8km	No pain, no gain C’mon, I’m nearly there	I can work through the pain	You can work through the pain
8-10km	Last push now I’ve done it	I will succeed	You will succeed